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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/718,667	11/22/2000	Niklas Stenstrom	45051-00006	2452

7590

06/28/2004

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EXAMINER

TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 06/28/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/718,667

Applicant(s)

STENSTROM ET AL.

Examiner

Khanh Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8, 15 and 16 is/are allowed.
- 6) ☒ Claim(s) 9-13 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/22/2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The Amendment filed on 04/02/2004 has been entered. Claims 1-16 are pending in this Office action.

Response to Arguments

2. Applicant's arguments with respect to claims 12-13 have been considered but are moot in view of the new ground(s) of rejection.

3. Applicant's arguments, see pages 8-11 of the Amendment, filed on 04/02/2004, with respect to claims 1-4, 6, and 15-16 have been fully considered and are persuasive. The rejection of claims 1-4, 6, and 15-16 has been withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "The wireless communication device" in line 1. There is insufficient antecedent basis for this limitation in the claim.

5. Claims 10-11 are also rejected due to dependency to rejected claim 9.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mouro et al. U.S. Patent 5,537,438 in view of admitted prior art of the instant application.

Regarding claim 12, figure 2 illustrates a mobile communication receiver including a channel estimator EC, a receive parameters pp, an equalizer with an integrated tracking means PO.

As disclosed in the abstract, a data block BD transmitted by a radio is received at an antenna 2, and processed by baseband converter 3 to produce a baseband signal. The impulse response of the channel is estimated, and a set of receive parameters (PP) is evaluated. The optimal length N_{opt} of the block (BD) is determined from the parameters PP. When the optimal length N_{opt} is less than the actual length N of the block BD, channel variation tracking PO is enabled to update channel estimate.

- In light of the aforementioned teachings, first of all, the received data block BD is channel quality indicative data as appreciated by one of

ordinary skill in the art since the received data block BD is directly related to the output of equalizer in figure 2.

- The step of determining optimal length N_{opt} of the block (BD) less than the actual length N of the block BD corresponds to the claimed step of determining whether the channel quality indicative data fail to meet a predetermined criterion.
- As recited above, if the optimal length N_{opt} is less than the actual length N of the block BD, channel variation tracking PO is enabled from a disabled state according to Mourot et al. teachings. As disclosed in column 11 lines 20-27, in disabled state, the tracking is not used in the process of estimating the channel and equalization. Mourot et al., however, does not expressly disclose in which enabled state an updated channel estimate is produced from the received signal and the sequence of decided symbols as claimed in the instant application. Referring back to figure 2, equalizer receives received signal through the channel estimator, and the tracking means PO is integrated into the equalizer. Hence, updated channel estimate is produced by the received signal as appreciated by one of ordinary skill in the art. Furthermore, as well known in the art of equalization, output of an equalizer is feedback and utilized to continue update the channel estimate in the process of equalizing the received signal. Admitted prior art, see figure 2, of the instant application does exactly just that. In view of that reason, it would

have been obvious for one of ordinary skill in the art at the time the invention was made that the tracking means PO as taught by Mourot et al. could be modified to update channel estimate using the received signal and sequence of decided symbols (feedback output of the equalizer) as taught by admitted prior art in the instant application. Furthermore, as disclosed column 11 lines 35-42 of Mourot et al. invention, channel variation tracking (PO) is undertaken only when necessary to guarantee receiver performance in term of significant reduction of power consumption.

Regarding claim 13, admitted prior art in figure 1 of the instant application (see page 3 lines 24-27, discloses that the equalizer output is calculated based on a squared distance between the received sequence and the predicted received sequence given the decided symbols.

Allowable Subject Matter

7. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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8. Claims 9-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. Claims 1-6 are allowed.

Regarding claim 1, said claim is allowed because the prior art of record, US Patent 5,185,764 and US Patent 5,537,438, does not teach or suggest the claimed features "wherein the controller is adapted to receive channel quality indicative data associated with an output from the equalizer, to determine whether the channel quality indicative data fail to meet a predetermined criterion, and, if so, to supply an enabling control signal to the channel tracker" and "wherein the enabling control signal is adapted to switch the channel tracker from a disabled state, in which disabled state no channel tracker within the digital communication receiver is enabled, to an enabled state, in which enabled state the updated channel estimate is produced".

10. Claims 7-8 are allowed.

Regarding claim 7, said claim is allowed because the prior art of record, US Patent 5,185,764 and US Patent 5,537,438, does not teach or suggest the claimed uniquely distinct features "wherein the controller is adapted to compare the updated channel estimate with an initial channel estimate and to supply a disabling control signal to the channel tracker, if the comparison indicates a difference smaller than a predetermined criterion".

11. Claims 15-16 are allowed.

Regarding claim 15, said claim is allowed because the prior art of record, US Patent 5,185,764 and US Patent 5,537,438, does not teach or suggest the claimed features "b) comparing the updated channel estimate with an initial channel estimate" and "c) conditionally, if the comparison indicates a difference smaller than a predetermined criterion, switching a channel tracker from an enabled state in which enabled state an updated channel estimate is produced from the received signal and the sequence of decided symbols, to a disabled state, in which disabled no channel tracker within the digital communication receiver is enabled".

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Furuya U.S. Patent 5,363,411 discloses "Low Power Consumption Receiver with Adaptive Equalizer".

Ramesh U.S. Patent 6,151,484 discloses "Communications Apparatus and Methods for Adaptive Signal Processing based on Mobility Characteristics".

Arslan et al. U.S. Patent 6,411,649 B1 discloses "Adaptive Channel tracking Using Pilot Sequences".


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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 703-305-2384. The examiner can normally be reached on Tuesday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT


JEAN B. CORRIELUS
PRIMARY EXAMINER

6/23/04